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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,405	09/26/2006	Atsushi Fukaya	8007-1117	1916
<small>465</small> YOUNG & THOMPSON 209 Madison Street Suite 500 ALEXANDRIA, VA 22314			<small>7590</small> EXAMINER CANTELMO, GREGG	
			<small>09/17/2009</small> ART UNIT 1795	PAPER NUMBER
			MAIL DATE 09/17/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/594,405

**Applicant(s)**

FUKAYA ET AL.

**Examiner**

Gregg Cantelmo

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF 298)
- Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Response to Preliminary Amendment***

1. In response to the preliminary amendment received September 26, 2009:
  - a. Claims 1-20 are pending.

***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Information Disclosure Statement***

3. The information disclosure statement filed September 26, 2006; December 22, 2006; and August 13, 2007 has been placed in the application file and the information referred to therein has been considered as to the merits.

***Drawings***

4. The drawings received September 26, 2006 are acceptable for examination purposes.

***Claim Objections***

5. Claims 8-10 are objected to under 37 CFR 1.75 as being a substantial duplicate of claim 7. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Applicant is advised that should claim 7 be found allowable, claims 8-10 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two

claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

6. Claims 13-14 are objected to under 37 CFR 1.75 as being a substantial duplicate of claim 12. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Applicant is advised that should claim 12 be found allowable, claims 13-14 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

7. Claims 16-18 are objected to under 37 CFR 1.75 as being a substantial duplicate of claim 15. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Applicant is advised that should claim 15 be found allowable, claims 16-18 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two

claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

8. Claim 20 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 19. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Applicant is advised that should claim 19 be found allowable, claim 20 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 7-10 and 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7-10 recited "derivative of" and "derivatives of" but fail to reasonably define what the terms encompass. Applicant is advised to remove these phrases from the claim to overcome this rejection.

Claims 12-14 are indefinite as they refer to silicon formulas (1) and (2) in the claim but fail to provide any antecedent basis for the claimed silicon formulas (1) or (2).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claim 1-2, 7-10 and 15-18 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by JP 2003-163032 (Go).

Go discloses a nonaqueous electrolyte composition comprising an organic solvent and an electrolyte salt dissolved in the organic solvent, the organic solvent being a mixed organic solvent comprising (a) 20% to 35% by volume of ethylene carbonate, (b) 35% to 45% by volume of ethyl methyl carbonate, (c) 15% to 35% by volume of dimethyl carbonate, and (d) 3% to 15% by volume of diethyl carbonate or propylene carbonate (para. 38 as applied to claim 1).

The organic solvent comprises (a) 25% to 35% by volume of ethylene carbonate, (b) 35% to 45% by volume of ethyl methyl carbonate, (c) 18% to 32% by volume of dimethyl carbonate, and (d) 3% to 10% by volume of diethyl carbonate or propylene carbonate (para. 38 as applied to claim 2).

The salts include similar salts as recited in claim 7 (see para. 25 as applied to claim 7-10).

The electrolyte above is employed in a secondary battery comprising the nonaqueous electrolyte above, a positive electrode and a negative electrode (as applied to claims 15-18).

11. Claim 1-2, 7-10 and 15-18 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. Patent Application Publication No. 2003/0113634 (Oh).

Oh discloses a nonaqueous electrolyte composition comprising an organic solvent and an electrolyte salt dissolved in the organic solvent, the organic solvent being a mixed organic solvent comprising (a) 20% to 35% by volume of ethylene carbonate, (b) 35% to 45% by volume of ethyl methyl carbonate, (c) 15% to 35% by volume of dimethyl carbonate, and (d) 3% to 15% by volume of diethyl carbonate or propylene carbonate (example 3 as applied to claim 1).

The organic solvent comprises (a) 25% to 35% by volume of ethylene carbonate, (b) 35% to 45% by volume of ethyl methyl carbonate, (c) 18% to 32% by volume of dimethyl carbonate, and (d) 3% to 10% by volume of diethyl carbonate or propylene carbonate (Example 3 as applied to claim 2).

The salts include similar salts as recited in claim 7 (paras. 35 and 43 as applied to claim 7-10).

The electrolyte above is employed in a secondary battery comprising the nonaqueous electrolyte above, a positive electrode and a negative electrode (experimental examples as applied to claims 15-18).

12. Claim 1, 7-10 and 15-18 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by CA 2334054 (Gan).

Gan discloses a nonaqueous electrolyte composition comprising an organic solvent and an electrolyte salt dissolved in the organic solvent, the organic solvent being a mixed organic solvent comprising (a) 20% to 35% by volume of ethylene carbonate, (b) 35% to 45% by volume of ethyl methyl carbonate, (c) 15% to 35% by volume of dimethyl carbonate, and (d) 3% to 15% by volume of diethyl carbonate or propylene carbonate (table 4 as applied to claim 1).

The salts include similar salts as recited in claim 7 (page 17, ll. 26-33 as applied to claim 7-10).

The electrolyte above is employed in a secondary battery comprising the nonaqueous electrolyte above, a positive electrode and a negative electrode (examples as applied to claims 15-18).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.



2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oh as applied to claim 1 above.

Example 3 of Oh teaches of a solvent mixture comprising EC/EMC/DMC/PC at a ratio of 30/35/25/10.

Claim 6 is directed to a solvent mixture comprising EC/EMC/DMC/PC at a ratio of 25/40/30/5.

In the broader sense, Example 3 is a quaternary solvent mixture which falls within the inventive concept of the instant application and the only differences between Example 3 of Oh and claim 6 are the ratios of EC/EMC (30/35 compared to 25/40) and the ratio of DMC/PC (25/10 compared to 30/5). These differences are held to be obviously minor differences in ranges and the prior art solvent mixture and minor variations therein would have been obvious to one of ordinary skill in the art. It has

been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

14. Claims 3-5 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gan as applied to claim 1 above.

With respect to claim 3:

Gan teaches of a solvent mixture comprising EC/EMC/DMC/DEC at various ratios which fall within the range of the inventive concept of the instant application. For example, in Table 4, Example 2, the ratio of EC/EMC/DMC/DEC is 30/32/28/10. Comparatively claim 3 recites a ratio of EC/EMC/DMC/DEC which is 30/40/20/10.

In the broader sense, Example 2 in table 4 is a quaternary solvent mixture which falls within the inventive concept of the instant application and the only difference between Example 2 of Gan and claim 3 is the ratios of EMC/DMC (32/28 compared to 40/20). This difference is held to be obviously minor differences in ranges and the prior art solvent mixture and minor variations therein would have been obvious to one of ordinary skill in the art. It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

Similarly with respect to claim 5:

Gan teaches of a solvent mixture comprising EC/EMC/DMC/DEC at various ratios which fall within the range of the inventive concept of the instant application. For example, in Table 4, Example 2, the ratio of EC/EMC/DMC/DEC is 30/32/28/10. Comparatively claim 3 recites a ratio of EC/EMC/DMC/DEC which is 25/40/25/10.

In the broader sense, Example 2 in table 4 is a quaternary solvent mixture which falls within the inventive concept of the instant application and the only differences between Example 2 of Gan and claim 5 is the ratios of EC/EMC/DMC (30/32/28 compared to 25/40/25). This difference is held to be obviously minor differences in ranges and the prior art solvent mixture and minor variations therein would have been obvious to one of ordinary skill in the art. It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

Similarly with respect to claims 4, 19 and 20:

Gan teaches of a solvent mixture comprising EC/EMC/DMC/DEC at various ratios which fall within the range of the inventive concept of the instant application. For example, in Table 4, Example 2, the ratio of EC/EMC/DMC/DEC is 30/32/28/10. Comparatively claim 3 recites a ratio of EC/EMC/DMC/DEC which is 25/40/30/5.

In the broader sense, Example 2 in table 4 is a quaternary solvent mixture which falls within the inventive concept of the instant application and the only difference, which is relatively minor, between Example 2 of Gan and claim 5 is the ratio of

EC/EMC/DMC/DEC (30/32/28/10 compared to 25/40/30/5). This difference is held to be obviously minor differences in ranges and the prior art solvent mixture and minor variations therein would have been obvious to one of ordinary skill in the art. It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

15. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Go, Oh or Gan as applied to claim 1 above, and further in view of JP 2004-039510 (Awano) or

The difference between Go, Oh and Gan and claim 11 is that neither Go, Oh nor Gan teach of the electrolyte silicon additive.

Awano teaches of adding the same silicon compounds to a nonaqueous electrolyte solution (abstract). The additive improves the cycle characteristics, low temperature characteristics, and long term stability of the battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of either Go, Oh or Gan by adding the silicon compound of Awano to the electrolyte since it would have improved the cycle characteristics, low temperature characteristics, and long term stability of the battery.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Cantelmo/  
Primary Examiner, Art Unit 1795